Item Unique Identification (IUID)
Intensive Tutorial

DIETS 3
Norfolk
April 6, 2010

Topics for Today

- **What is IUID?**

- How do I "do" IUID?

- Who has a role in IUID?

- What are the benefits of implementing IUID?

UID is…

➢ Unique Identification (**UID**) is a system of identifying entities to distinguish them from each other.

➢ Item Unique Identification (**IUID**) is a system of marking items with globally unique **Unique Item Identifiers (UIIs)** that distinguish them from all other like and unlike items.

➢ Other unique identification efforts include:
  ➢ Real Property Unique Identification (RPUID)
  ➢ Acquisition Program Unique Identification (APUID)
  ➢ System Unique Identification (SYSUID)
  ➢ Organization Unique Identification (OUID)

Scope of the UII

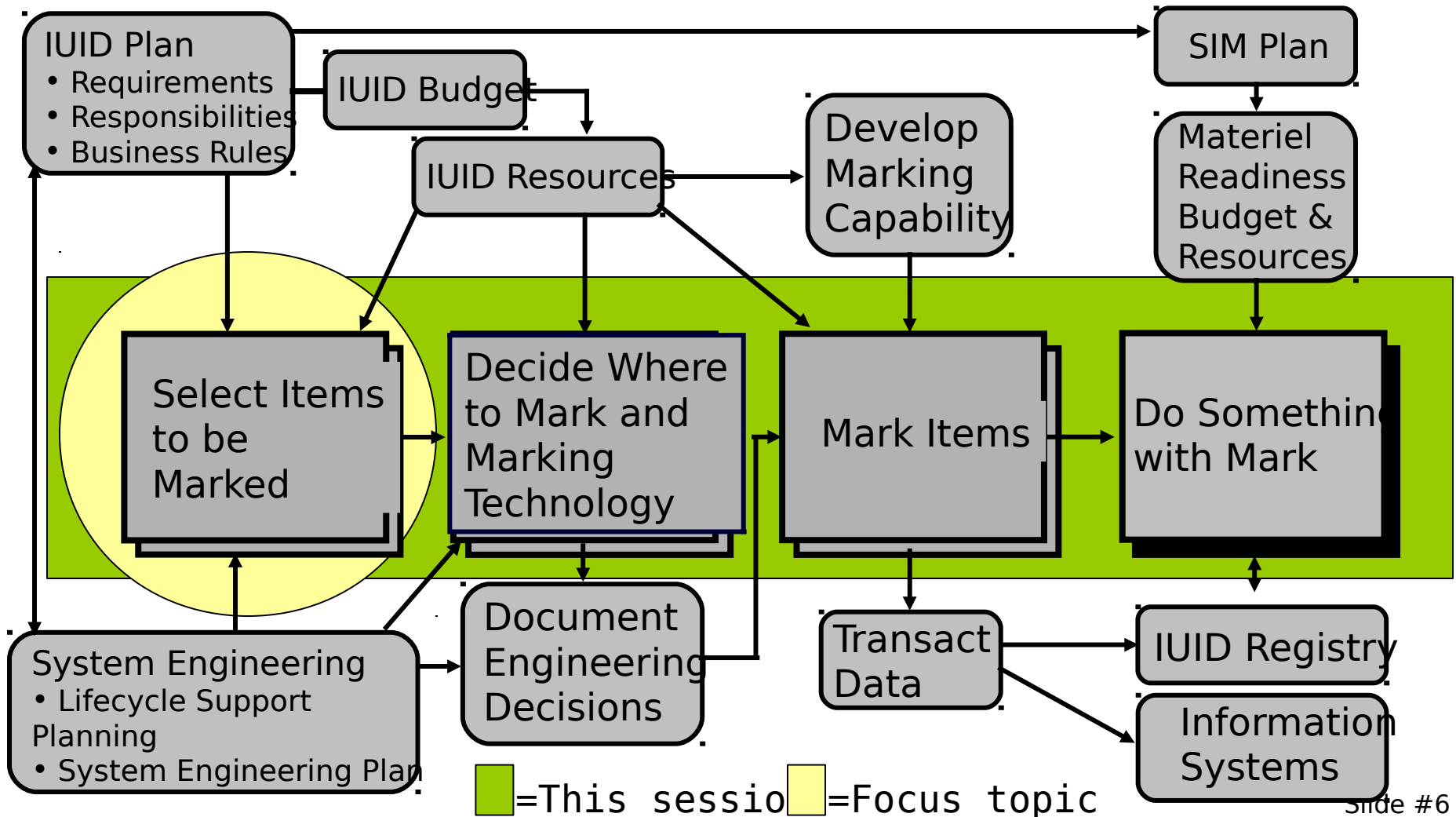| A UII Is	A UII Is Not
- A Data Element - A Unique Identifier for an Item - Globally Unique - Unambiguous - Permanent - Created by Concatenating Specific Data Elements - The enabler for business intelligence	- A Device for Communicating Data, such as Radio Frequency Identification (RFID) Tags, Contact Memory Buttons, Linear Bar Codes, or 2-D Data Matrices - A Replacement for the National Stock Number - Intelligent Data that Yields Information About the Item - Transferable from one item to another

Topics for Today

- What is IUID?
- **How do I "do" IUID?**
- Who has a role in IUID?
- What are the benefits of implementing IUID?

IUID Process

IUID Plan
- Requirements
- Responsibilities
- Business Rules

IUID Budget

IUID Resources

Develop Marking Capability

SIM Plan

Materiel Readiness Budget & Resources

Select Items to be Marked

Decide Where to Mark and Marking Technology

Mark Items

Do Something with Mark

System Engineering
- Lifecycle Support Planning
- System Engineering Plan

Document Engineering Decisions

Transact Data

IUID Registry

Information Systems

=This session   =Focus topic

Policy Overviews

➢ US DoD:

  ➢ IUID is required for all property items delivered to the Government if:

  ✓ *Acquisition cost is greater than or equal to $5,000*

  ✓ *DoD serially managed, mission essential, or controlled inventory, as determined by the requiring activity*

  ✓ *IUID Relevant as determined by the requiring activity*

  ✓ *Regardless of value, any DoD serially managed subassembly, component or part embedded within an item, and its parent*

  ✓ **DFARs Clause 252.211-7003 Identifies items to be IUID'd**

    ➢ Flow down from Prime contractors

  ✓ **DFARs Clause 252.211-7007 Establishes GFE reporting requirements**

➢ International IUID initiatives:
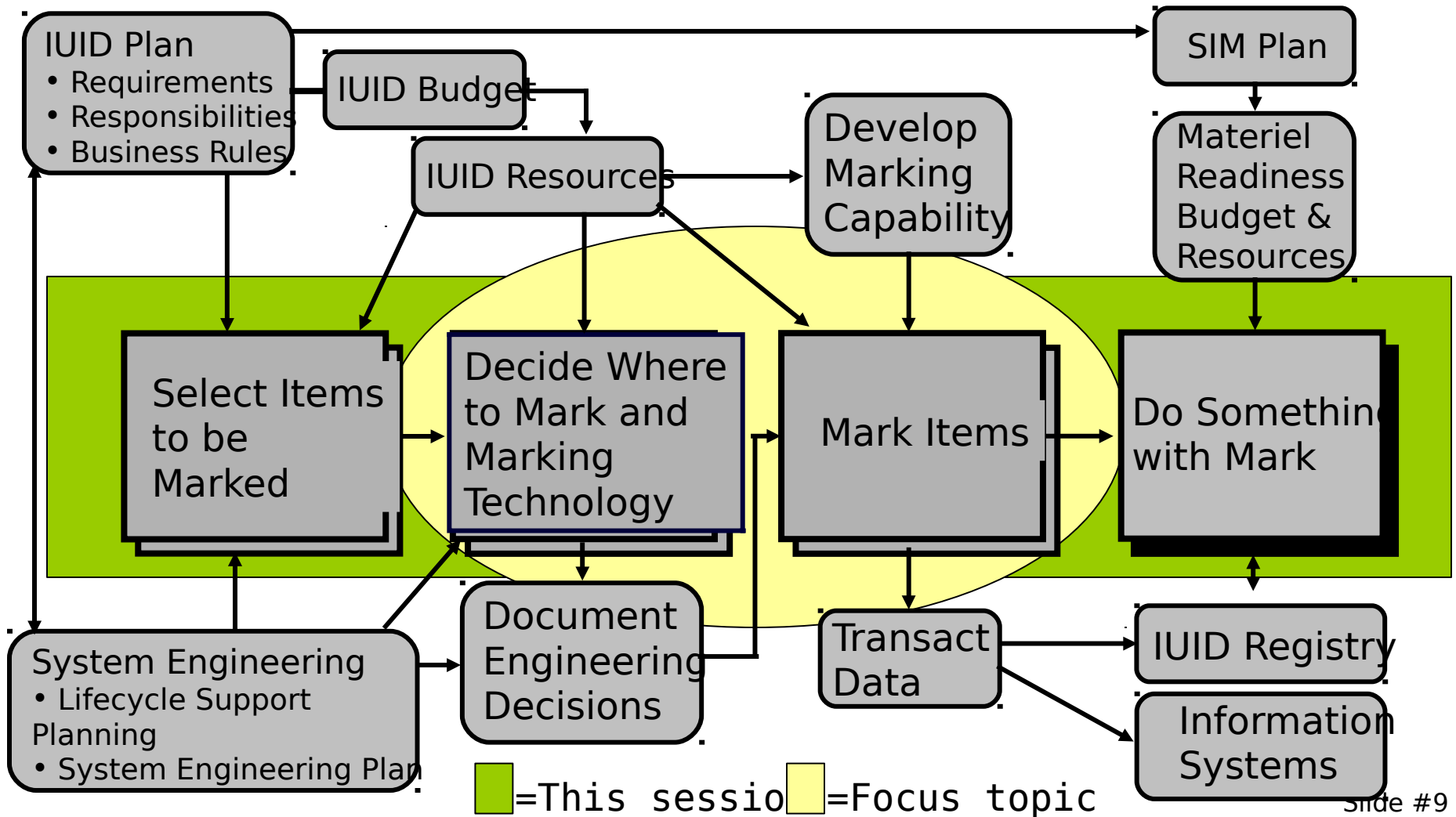
  ➢ Netherlands – policy active

Identifying Item UID relevancy for US DoD
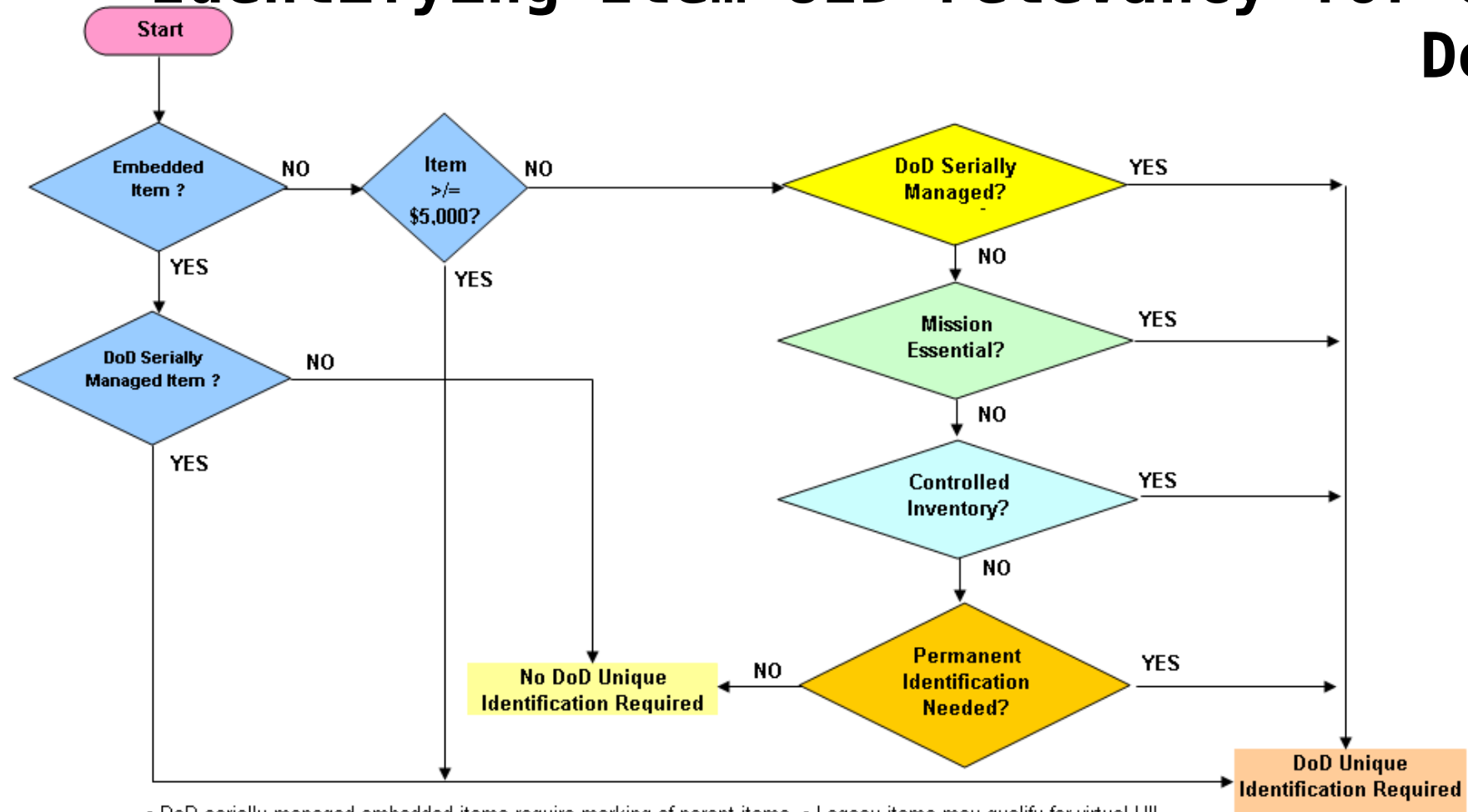
- DoD serially managed embedded items require marking of parent items   - Legacy items may qualify for virtual UII

IUID Process

Automatic Identification Technology

Contact Memory Buttons

Passive/Active RFID Tags

Linear Barcode

42000 06200

2-D Barcodes

MaxiCode

QR Code

Data Matrix

PDF417

Bullseye **Aztec**

NOT TO SCALE
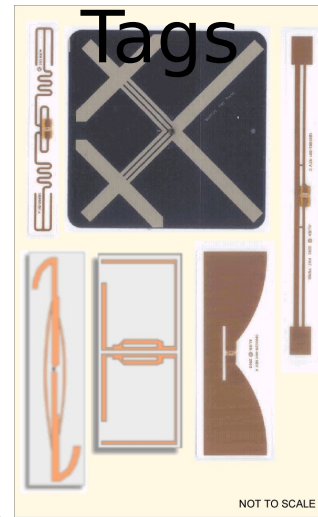
Unique Item Identifier is always encoded in a Data Matrix

IUID-RFID Relationship

RFID tags that carry data are required to be attached to packages at multiple levels, including item packages, cases, and pallets. Unique Item Identifiers are required to be attached or directly marked on items using a data matrix to carry the UII data elements.
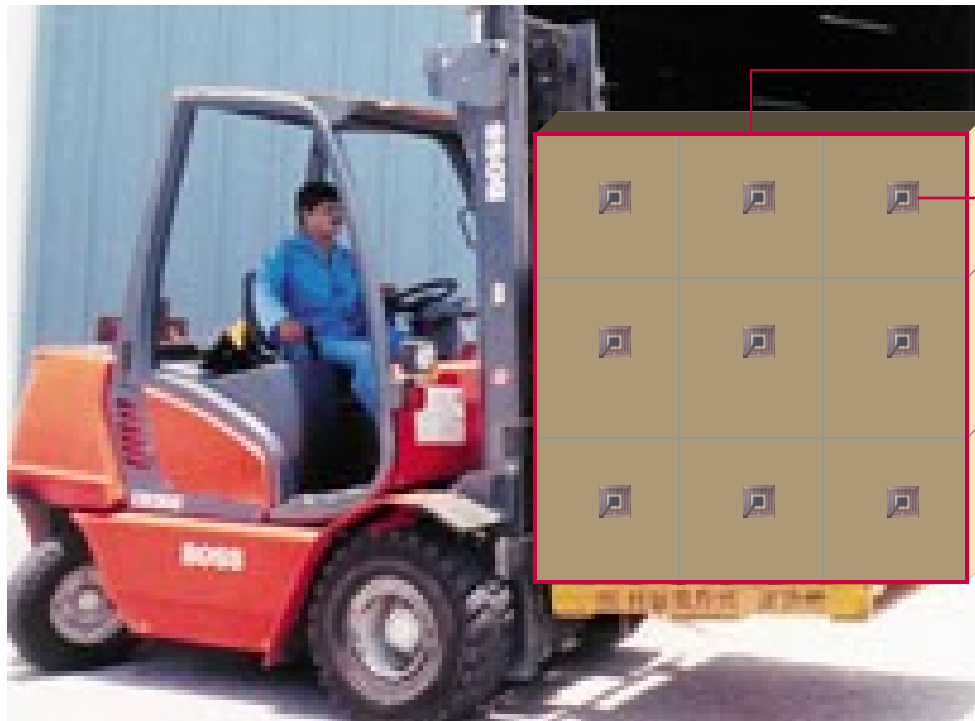
RFID Tag (Pallet Level)

RFID Tag (Case Level)

RFID Tag (Item Package Level)

IUID Data Matrix (Item Level)
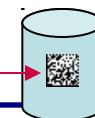
Marking Techniques

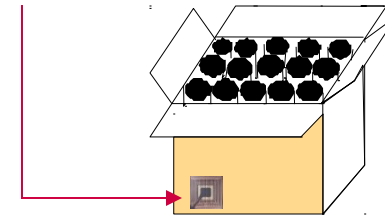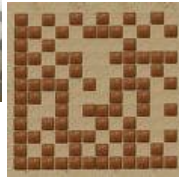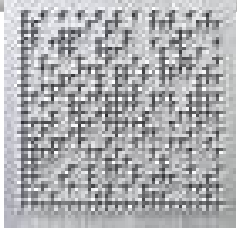| Labels (Stickers)	Ink Jet Printing
Data Plates	Laser Ablation
Dot Peen	Laser "Annealing"
Laser Etch	Cast/Forged
Chemical Etch	Laser Bonding
Silk Screening	Embroidery
Thermal Spray	Photo Etch

Compliant UII marks are optically read…so almost any marking method will work!

Marking Considerations

➢First leverage existing marking methods and tools
- IUID does require a 2D ECC 200 Data matrix, but does not dictate the marking method used other than **permanency and durability requirements**

➢If parts are currently marked with data plates or labels, IUID should be incorporated into the existing marking practice where possible

➢UIIs are required by MIL-STD-129(P) Change 4 to be placed on exterior of packaging in order to be able to identify the items through supply chain events

➢Organizations should explore the multiple ways to manage technical documentation and updates to minimize implementation costs

➢Implement the Marking Guidance
- Central references should be updated if possible vice drawings

Applying the UII

> **Vendor-Applied-at-Source:** Marking applied when item is manufactured

> **Opportunity-Based Item Application:** Can be done in the field or factory, wherever it is convenient to gain access to items either on an end item or available in a storage facility (phase maintenance, scheduled servicing, depot rebuild or overhaul processes, and work-order processes during modification)

> **Seek-and-Apply:** Used for particular items held within service, either at the end item or in storage. This strategy is dependent on establishing the location and availability of items before deployment of application equipment and teams. This approach is dependent upon good legacy data, and will demand greater overhead of coordinated effort to effect access to the assets.

> **Gated:** The interception of items as they transit specific gates within the supply chain. After identification, the situation can be resolved by diverting the item back to the vendor for application, provision of an application capability at the specific supply gate, or diversion of the item to a centralized application facility.

Unique Item Identifier (UII) is…

UII is . . .
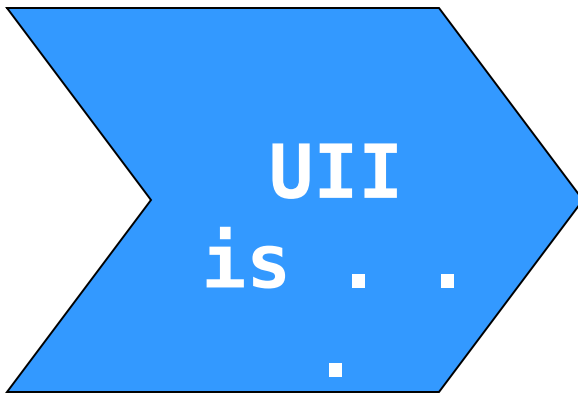
. . . the set of data for tangible assets that is globally unique and unambiguous, ensures data integrity and data quality throughout the life of the component, and supports multi-business ions and users.

EID
(12V)194532636

Orig. Part No.   (1P)1234

Serial No.   (S)786950

Create and Generate the UII

The components that make up the UII are identified in the table below. Each enterprise has two op	UII Construct #1	UII Construct #2
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part Number
UII is derived by concatenating the data elements IN ORDER:	Issuing Agency Code* Enterprise ID Serial Number	Issuing Agency Code* Enterprise ID Original Part Number / Lot or Batch Number Serial Number
Data Identified on Assets Not Part of the UII (Separate Identifier)	Current Part Number** Other Traceability Number***	Current Part Number ** Other Traceability Number***

*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (e.g., Dun and Bradstreet, GS1). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.

** In instances where the original part number changes with new configurations (also known as part number roll), the current part number may be included on the item as a separate data element for traceability purposes.

*** The data identifier 30T has been designated for use as a traceability number that is not part of the UII. For example, applications may specify 30T for encoding lot or batch number when the lot or batch number is not required or desired in the UII.

Mark Elements

A compliant IUID Mark – Syntax & Semantics

➢ Using the syntax of ISO/IEC 15434, TEIs, AIs, or DIs can be used

➢ Construct #1 (serialization within enterprise), Construct #2 (serialization within Part/Lot/Batch), or DoD recognized equivalents are acceptable

➢ This interoperability of formats permits enterprises to use their existing serialization processes

➢ Resulting Unique Item Identifier (UII) is globally unique

UII Construct #2

EID	(12V)194532636
Orig. Part No.	(1P)1234
Serial No.	(S)786950

UII Construct #2
UN194532636 1234 786950

IAC — DUNS — Orig. Part No. — Serial No.

This example uses MH10.8.2 Data Identifiers.

Formats:

ATA: Text Element Identifiers (TEIs)

[)>^R_S12^G_SMFR 0CVA5^G_SSER 674A36458$^R_S$$^E_O_T$

GS1: Application Identifiers (AIs)

[)>^R_S05^G_S8004 06141411A0B9C3D6$^R_S$$^E_O_T$

MH 10.8.2: Data Identifiers (DIs)

[)>^R_S06^G_S17V0CVA5^G_S1P1234^G_SS786950$^R_S$$^E_O_T$

Read the Mark; Derive the UII

A imaging device, or scanner, will "read" the mark and detect the encoded data string. The information system will determine what data is retained (i.e., UII, serial number, etc.)

$[)>_{S}^{R}06_{S}^{G}17V0CVA5_{S}^{G}1P1234_{S}^{G}S786950_{S}^{R}{}^{E}O_{T}$
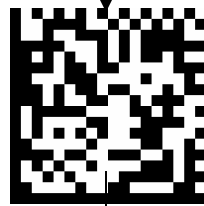
The concatenated UII

D0CVA51234786950

DoD IUID Equivalents

➤ Criteria for Determining DoD IUID Equivalents
- Must contain an enterprise identifier which is assigned by a registration or controlling authority
- Must uniquely identify an individual item within an enterprise identifier, product or part number
- Must have an existing Data Identifier (DI) or Application Identifier (AI) listed in ANSI MH10.8.2, Data Identifier and Application Identifier Standard

➤ Identifiers Meeting the Equivalence Criteria
- Global Individual Asset Identifier (GIAI) GS1 (AI:8004)
- Global Returnable Asset Identifier (GRAI), GS1 (AI: 8003)
- Vehicle Identification Number (VIN) ISO 3779 (DI: I)

Virtual UIIs

➢ UIIs can be assigned in advance of items being physically marked, only:
  - For legacy items already in inventory or operational use
  - For government property in the possession of contractors

➢ Certain conditions apply:
  Requires serialized identity data to have been previously marked on item
  Requires Virtual UII registration in the IUID Registry
  Identifies item until a trigger event occurs for physical marking (maintenance, etc.) at

Use Virtual UII cautiously!

Business Rules for UII Construction & Physical Marking

➢ DoD organizations may not dictate to the Contractor either the UII construct, semantics, serialization or the use of the Government's Enterprise Identifier

➢ If UII Construct #2 is used, the enterprise must maintain the original part number on the item for the life of the item

➢ The UII will not change over the life of the item. Therefore the component data elements of the UII will not change over the life of the item

➢ Where space is available, human readable information for UII data elements shall be marked on the item.

Parent/Child Relationship

Product Data	Supply Chain	Unique Items	UII **

Enterprise

Prime   PN 200H0028

End Item Specs

Item Markings

EI 194532636
PN 200H0028
SN 003896*

UN194532636200H0028003896

End Item
Delivery to Govt

List of Hardware UIIs

Tier 1   PN 210H0611

Subassembly Specs

Item Markings

EI 040535536
PN 210H0611
SN 006392*

UN040535536210H0611006392

Spares
Delivery to Govt

List of Hardware UIIs

Tier 2   PN 216H1439

Component Specs

Item Markings

EI 080907280
PN 216H1439
SN 020890*

UN080907280216H1439020890

Spares
Delivery to Govt

List of Hardware UIIs

Tier 3   PN 218H2861

Part Specs

Item Markings

EI 083949107
PN 218H2861
SN 105742*

UN083949107218H286110574
2

Spares
Delivery to Govt

UII = Unique Item Identifier; EI = Enterprise Identifier

* Serialized within the part number using DUNS as EI

**UN = Issuing Agency Code for DUNS

Topics for Today

- What is IUID?

- How do I "do" UID?

- **Who has a role in IUID?**

- What are the benefits of implementing IUID?

Key Responsibilities for IUID Implementation
New Acquisition - Government

➢**Program Managers/Item Managers:**
  - ➢Identify items requiring unique identification, including embedded subassemblies, components and parts as part of IUID Implementation Plan
  - ➢Ensure functional requirements to implement are complete
  - ➢Coordinate metrics and reporting

➢**Logistics:** Identify data capture, transaction, and update strategies for assets in logistics chain

➢**System Engineering/Design Authority:** Support identification of assets to be IUID'd from lifecycle traceability perspective

➢**Contracting Officers:** Include DFARS clauses in contracts when applicable
  - ➢252.211-7003, Item Identification and Valuation, for contracts that require delivery of items.
  - ➢252.211-7007, Government Furnished Equipment Reporting

➢**Quality Assurance/DCMA:**

Key Responsibilities for IUID Implementation
New Acquisition - Contractor

➢**Contracting:**
  - ➢ Review contract clauses and communicate requirements to organization
  - ➢ Flow down requirements to subcontractors as needed

➢**System Engineering/Design Authority:** Determine appropriate marking methods, leveraging existing capabilities, and update technical documentation where contractor is design authority

➢**Operations:**
  - ➢ Determine impact to business processes and integrate where necessary
  - ➢ Seek opportunities for process improvement through AIDC

➢**Quality Assurance:** Identify processes to assess quality related to IUID (verification and validation per ISO standards referenced in Mil-Std-130)

➢**Packaging**: Conform to Mil-Std-129 requirements for marking packaging with IUID data

Key Responsibilities for IUID Implementation
Legacy Items - Government

➢**Program Managers/Item Managers:**
  ➢Identify items requiring unique identification, including embedded subassemblies, components and parts as part of IUID Implementation Plan
  ➢Identify marking strategies

➢**System Engineering/Design Authority:** Determine appropriate marking methods, leveraging existing capabilities, and update technical documentation where DoD is design authority

➢**Contracting Officers:**
  ➢Include DFARS clauses for contracts under which items will be marked and for provision of Government Furnished Property
  ➢Negotiate or renegotiate with contractors to provide marking and registration services

➢**Logistics/Maintenance**: Implement marking strategies for legacy assets in accordance with Mil-Std-130 and packaging in accordance with Mil-Std-129

Key Responsibilities for IUID Implementation
Legacy Items - Contractor

➢**Contracting:** Identify IUID requirements in contracts for GFP, repair items that require IUID marking or reporting

➢**Property Managers:** Manage the assignment and reporting of IUID data for GFP

➢**System Engineering/Design Authority:** Determine appropriate marking methods, leveraging existing capabilities, and update technical documentation where contractor is design authority

➢**Operations:**
  ➢Determine impact to business processes and integrate where necessary
  ➢Seek opportunities for process improvement through AIDC

➢**Quality Assurance:** Identify processes to assess quality related to IUID (verification and validation per ISO standards referenced in Mil-Std-130)

➢**Packaging**: Conform to Mil-Std-129 requirements for marking

Topics for Today

- What is IUID?

- How do I "do" UID?

- Who has a role in IUID?

- **What are the benefits of implementing IUID?**

Why UID?

UID…

➢ **Provides** *"The Key"* **to discovery and correlation of item, real property and human resource information so DoD can** *consistently locate, control and value assets* **anywhere and anytime**

➢ **Enables** *globally accessible and secure* **enterprise data**

➢ **Registries enable** *creation of UID mission critical services* **to:**

   ➢ **Translate legacy data for existing DoD systems**

   ➢ **Enable access for operational support**

IUID: What makes it so special?

IUID…

➢ **Provides the** "data key" **to item life cycle traceability in military business processes and information systems and provides reliable and accurate data for management, financial, accountability and asset management purposes**

➢ **Enables the discovery and correlation of item information so DoD can *consistently locate, control and value items* anywhere and anytime**

➢ **Enables *globally accessible and secure* enterprise data**

➢ **Enable joint paperless management**
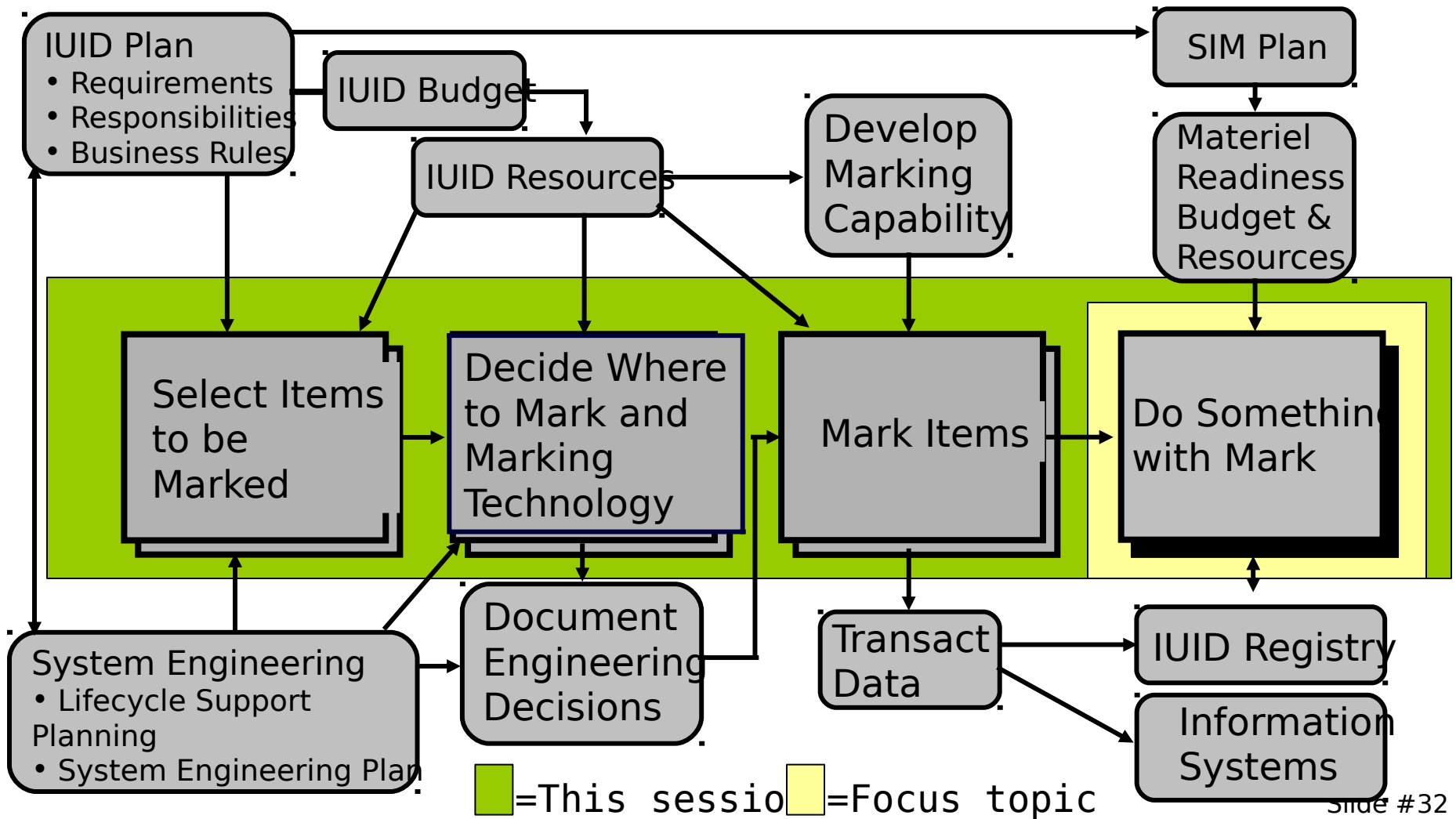
IUID in the Regulations and Requirements

➢ DoD 8320.03 Unique Identification (UID) Standards for a Net-Centric Department of Defense – March 2007

➢ DoDI 8320.04 IUID Instruction, IUID Standards for Personal Property –June 2008

➢ DFARS 252.211-7003

➢ DFARS 252.211-7007 (Government Furnished Property)

➢ IUID Program Implementation Plans

➢ IUID Service Scorecards (quarterly reporting)

➢ DoDI 5000.2 requires IUID be addressed in System Engineering Plans

➢ Investment Review Board criteria established (AT&L lead with BTA)

➢ NATO Standard Agreement 2290

IUID Process

IUID Plan
- Requirements
- Responsibilities
- Business Rules

IUID Budget

IUID Resources

SIM Plan

Develop Marking Capability

Materiel Readiness Budget & Resources

Select Items to be Marked

Decide Where to Mark and Marking Technology

Mark Items

Do Something with Mark

System Engineering
- Lifecycle Support Planning
- System Engineering Plan

Document Engineering Decisions

Transact Data

IUID Registry

Information Systems

■ =This session □ =Focus topic

IUID Value Proposition

Capabilities   **Requirements**   **Objectives**

**Financial Management
Warranty Management
Tracking Item Performance & Age
Failure Analysis
Reliability Improvement
Maintenance Productivity
Supply Productivity
Safety
Accountability**

Automated Data Collection

Machine Readable Marking

Value

Processes

Analysis

Information Systems

Supply Chain Events

Uniquely Identified Items

Intensive Life Cycle Support Management

Item Unique Identification (IUID)

Unique Item Identifier

Payback

Resources

AIDC Benefits
Automatic **I**dentification and **D**ata **C**apture

- Reduces human error in inventory control
  - NAVEOD realizing 3 year payback period for IUID implementation from increased accuracy due to scanning

- Reduces manpower hours spent in data entry
  - Rolls Royce study determined that the equivalent of over 3% of their workforce transcribes part information manually

- Creates capabilities to identify items and histories (e.g., source, usage, and maintenance)
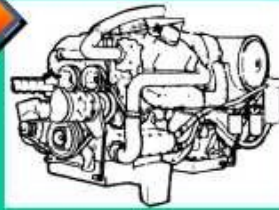 - JAMISS – LAV (next slide)
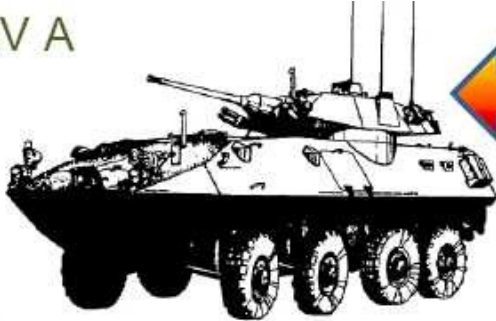
LAV A

JAMISS tracking miles, hours, and maintenance on this vehicle based on IUID.
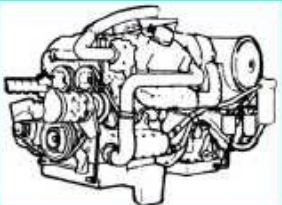
LAV Engine A

JAMISS tracking miles, hours, oil changes, rebuilds and maintenance on this engine based on IUID.

Engine A removed from LAV A for overhaul. Overhaul data added in JAMISS and remains with Engine A regardless of LAV installed in.
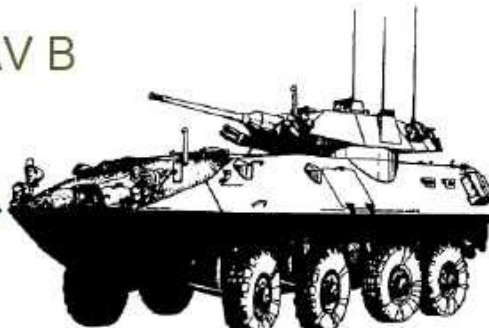
Rebuilt LAV Engine A installed in LAV B. LAV Engine A data and history associated to LAV B in JAMISS with IUID

LAV Engine A

LAV B

Joint Asset Maintenance Integrated Support System (JAMISS) and IUID
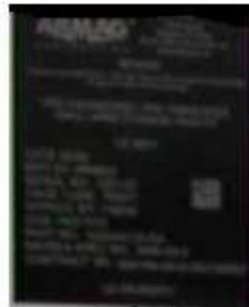
Problem Statement:
The Automated Armory process is inefficient. Accountability and Visibility of assets are outdated.

Solution:
Weapons are marked, identified and tracked with UIIs. Marines are identified with CAC.
Associations are made through UII-CAC-unit views.

- **Who has entered the armory?**
- **Who issued the item?**
- **Who was the item issued to?**
- **Complete inventory**
- **Complete history**

Results from Camp Pendleton

Metric	Baseline	Goal	Actual Result
Time per Class Picking Up	>34 Hours	<1Hour	<1Hour
Reporting Accuracy	<80%	100%	98%
Traceability and Visibility of Assets	<90%	100%	TBD
Quality of Data and Information	<83%	100%	98%

Benefit Examples

Product Lifecycle Management	Intensive Item Management	Property Accountability
F-16 Repair – $123M over 10 years / projected $1B in savings over life of program	Navy – 25% reduction in annual carcass loss of $80M	DPAS Office Study – $97.5M reduced labor costs for DoD physical inventories
Army AH-64 – 5.2% improved readiness; 41K less MX labor hrs Army UH-60 – 4.4% improved readiness; 36K less MX labor hrs	Navy – $7M - $38M in labor savings for error corrections & data entry from SNT deployment	USMC SIM equip issue study: time saved: >= 33 hrs; reporting accuracy: >= 18%; data quality: >= 15%
Navy ERIP Program – 3X T58 engine time-on-wing & 2X T64 engine time-on-wing	Navy – suppliers (ICP) labor savings of $710K over two years	
AF Serial # Tracking BCA – 1% to 5% reduction in spares procurement ($204M to $1B annually) through SIM	Navy SNT BCA – $109M in acquisition savings over 6 years	
AF Serial # Tracking BCA – 10% Navy items retrograded	Coast Guard ALC – 2D data matrix reduces	

Lessons Learned

- IUID is about more than marking and registering UIIs
- IUID should be considered in a global context
  - Not just a DoD initiative
  - International benefits across Gov't agencies, industry, and coalition partners
- Identify and involve all stakeholder groups in planning efforts
  - Groups involved in implementing IUID
  - Groups that can and will benefit from IUID
- It is the DoD's responsibility to determine which items will require IUID
  - Contractors may go beyond DoD requirements
- Government must communicate requirements clearly
  - Contract structure - use of Line Items, attachments, and exhibits
  - Provision of technical authority and documentation when required
  - For items used across multiple programs, if one requires IUID all should require

Lessons Learned

- Consider existing marking and asset management practices first
  - How are items marked today?
  - For data plates and labels, is there available room to add Data Matrix?
- Ensure IUID is integrated into Quality Assurance processes
  - Quality must be introduced at the front end
  - Readability and accuracy are crucial throughout item lifecycle
- Ensure serialized management practices are integrated with IUID
  - IUID must be the data key for SIM to enable true lifecycle data association
- IUID can serve as a forcing function to standardize
  - Mergers and acquisitions have created complexity in property management
  - Manufacturers can benefit from lifecycle data as well as government

DoD: Facing new challenges…

Challenges:

- *Rapidly moving forces on a dynamic battlefield*
- *Demand for better information on assets*
- *Need for more effective visibility and management of inventory*

How we will meet them:

- *Improve business processes now*
- *Improve confidence*
- *Influence the direction and cost of technology development*
- *Drive the standards to work for us*
- *Facilitate the*

Why a single standard across the enterprise?

"I think the industry has sold itself on a program that offers so little return that it simply won't be worth the trouble and expense"

...ussing the potential ...f the barcode in **1975***

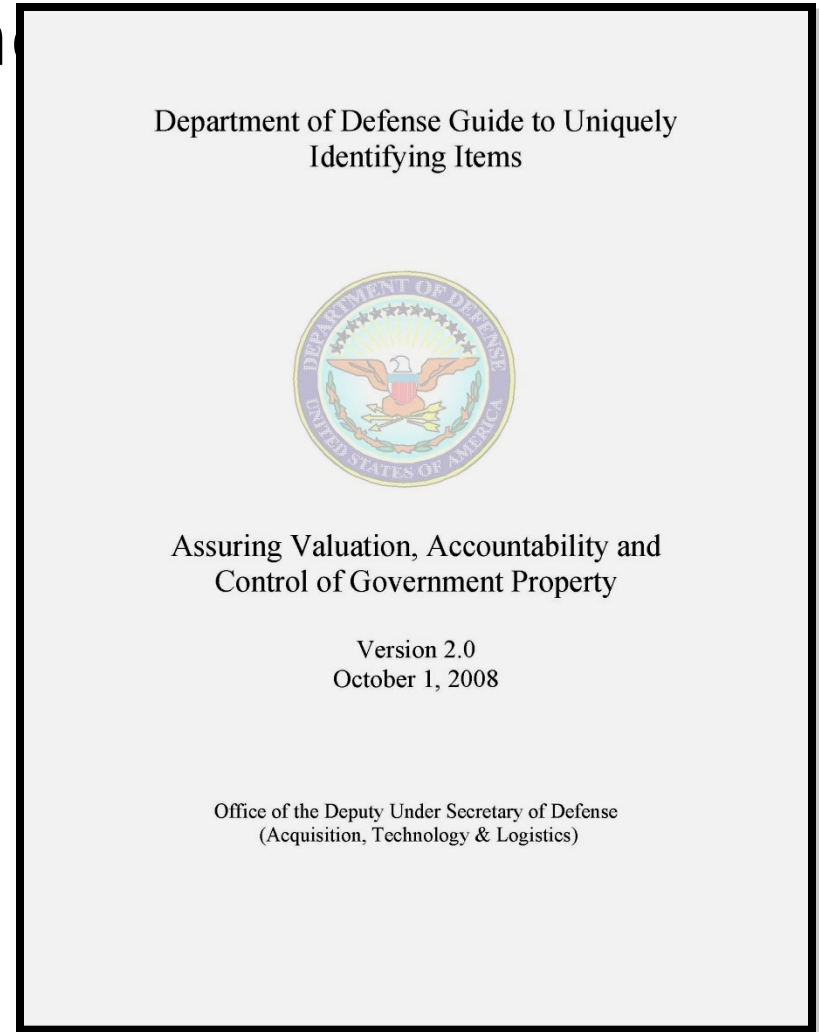*"Scanning Hits a Snag," Progressive Grocer, December 1...

Implementation Guidance

DoD Guide to Uniquely Identifying Items V2.0 (October 1, 2008)

Appendix D – The Mechanics of Item Unique Identification

Addresses Constructs 1 & 2

Multiple examples provided

Department of Defense Guide to Uniquely Identifying Items

Assuring Valuation, Accountability and Control of Government Property

Version 2.0
October 1, 2008

Office of the Deputy Under Secretary of Defense
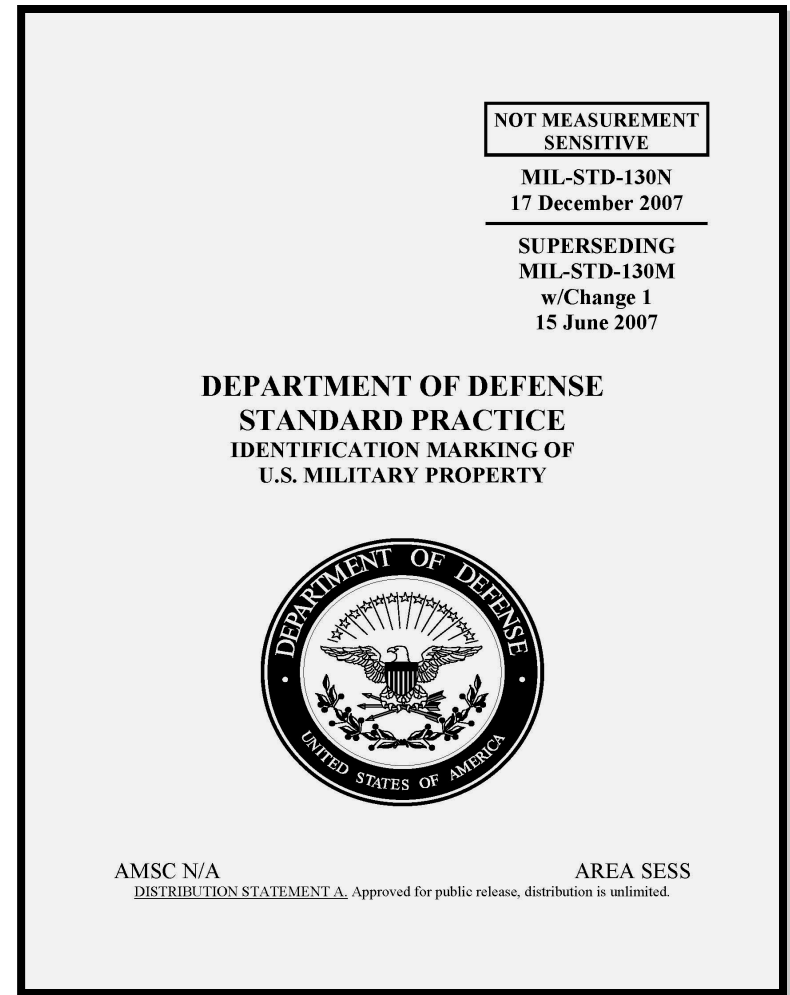(Acquisition, Technology & Logistics)

Marking Items

MILSTD 130N
DoD Standard Practice [for] Identification of U.S. Military Property 17 December 2007 [Supersedes "M"]

Establishes quality requirements

Provides "*further clarification and increased insight and guidance for the implementation of machine-readable information (MRI) for item identification*

NOT MEASUREMENT SENSITIVE

MIL-STD-130N
17 December 2007

SUPERSEDING
MIL-STD-130M
w/Change 1
15 June 2007

DEPARTMENT OF DEFENSE STANDARD PRACTICE
IDENTIFICATION MARKING OF
U.S. MILITARY PROPERTY

AMSC N/A   AREA SESS
DISTRIBUTION STATEMENT A. Approved for public release, distribution is unlimited.
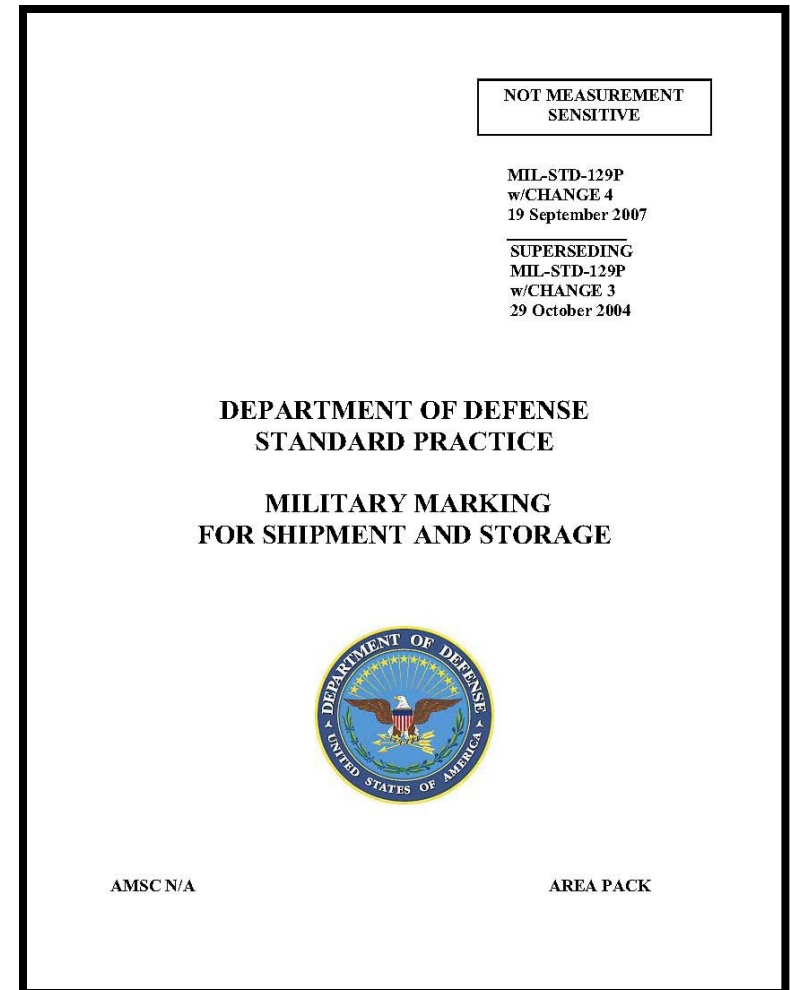
Marking Packaging

MILSTD 129(P) Change 4
DoD Standard Practice
[for] Military Marking
For Shipment and Storage
19 September 2007
[Supersedes "Change 3"]

Establishes labeling
requirements

Provides instruction on
placing UIIs in machine
readable format on exterior
of packaging, to facilitate
item identification and
automatic data capture

NOT MEASUREMENT
SENSITIVE

MIL-STD-129P
w/CHANGE 4
19 September 2007

SUPERSEDING
MIL-STD-129P
w/CHANGE 3
29 October 2004

**DEPARTMENT OF DEFENSE
STANDARD PRACTICE**

**MILITARY MARKING
FOR SHIPMENT AND STORAGE**

AMSC N/A   AREA PACK

Getting Started: Online Resources

Official DoD UID Policy Office Website

www.uniqueid.org

Comprehensive resource of UID and IUID policies, standards, directives,
videos and success stories.
Be sure to sign up for the *IUID in Action* eNewsletter!

IUID Helpdesk

defensepolicysupport@ebpsc.org or 1.877.376.5787

Defense Acquisition University

**www.dau.mil
(https://dau.mil/uid)**

DAU offers **2** distinct online courses to increase your IUID knowledge

CLE040 "Item Unique Identification Marking" and

CLM200 "Item Unique Identification"